AMENDMENTS TO THE CLAIMS

Listing of claims:

This listing of claims replaces all prior versions and listings of claims in the application.

1 - 76 (Canceled)

Claim 77 (Previously Presented): A method of evaluating a sample, using an electron beam apparatus comprising:

preparing a plurality of standard marks having different line and space patterns;

selecting one of standard marks, which has a line and space pattern corresponding to a width of a line on the sample to be evaluated;

irradiating the selected standard mark with a plurality of electron beams having different diameters at a plurality of times, respectively;

detecting secondary electron beams emitted from the selected standard mark at the respective irradiation times to evaluate S/N ratios;

selecting a diameter from the different diameters of the irradiated electron beams, with which a maximum S/N ratio has been obtained in the S/N ratio evaluation;

irradiating said sample with a primary electron beam having the selected beam diameter;

detecting a secondary electron beam generated from the sample by the irradiation; and

evaluating the sample,

wherein said electron beam apparatus comprises:

an electron gun having a cathode for forming a primary electron beam;

a lens positioned near said electron gun;

a beam separator for separating said secondary electron beam from a primary electro-optical system and directing it to a secondary electron detector; and

an objective lens for accelerating said secondary electron beam emitted from the sample,

wherein said beam separator is positioned above said objective lens so that the secondary electron beam passes through said objective lens and then is deflected and separated from said primary electro-optical system without entering a second lens from the sample surface.

Claim 78 (Previously Presented): A method of evaluating a sample according to Claim 77, further comprising:

accelerating said secondary electron beam emitted from the sample by an objective lens; and

deflecting said secondary electron beam to said secondary electron detector by a beam separator which comprises a saddle-shaped deflector arranged outside of a vacuum wall.

Claim 79 (Previously Presented): A method of evaluating a sample according to Claim 77, further comprising:

detecting a moving speed of a stage for carrying the sample thereon; and

calibrating the amount of deflection for the primary electron beam in accordance with the moving speed of the stage detected at the speed detection.

Claim 80 (Previously Presented): A method of evaluating a sample according to Claim 77, further comprising:

adjusting a beam dimension or a beam current of the primary electron beam to maximize a contrast or an S/N ratio in a particular pattern in electric signals of the secondary electron beam detected by said detector.

Claim 81 (Previously Presented): A method of evaluating a sample according to Claim 77, further comprising:

detecting the amount of a primary electron beam irradiated to the sample; and

controlling to prevent the amount of irradiated primary electron beam per unit area from exceeding a previously set predetermined value based on the amount of irradiation obtained by detecting the irradiated amount.

Claim 82 (Previously Presented): A method of manufacturing a semiconductor device, comprising:

preparing a wafer,

processing said wafer; and

evaluating said wafer during the wafer processing, using a method according to Claim 77.

Claim 83 (Previously Presented): A method of evaluating a sample according to Claim 77, further comprising:

comparing an image of a standard pattern for the sample with an actual image of the sample generated by said electron beam apparatus, wherein an image of a particular location on the sample which is expected to suffer defects when a pattern under testing is formed on the sample with a corresponding standard pattern image, or with a pattern image for the sample which is expected to suffer less defects.

Claim 84 (Previously Presented): A method of evaluating a sample according to Claim 77, further comprising:

acquiring a plurality of images of regions under testing displaced while partially overlapping one another on the sample;

storing a reference image; and

determining a defect on the sample by comparing each of the acquired images of the region under testing, with the stored reference image.